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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,980	03/07/2005	Yasuhiro Hase	040116	7990

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EXAMINER	
THOMAS, BRADLEY H	
ART UNIT	PAPER NUMBER
2835	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,980	HASE ET AL.	
	Examiner	Art Unit	
	Bradley H. Thomas	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/07/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Applicant is advised to review the use of the word "code" throughout the entire specification (Title, Abstract, etc.), namely pertaining to use of the term "code type thermal fuse". It seems as if "code" is being used to refer to the shape or the type of the thermal fuse, instead of more common names in the art such as "core" or "cord". While applicant is entitled to use their own terminology, it is not exactly clear why the term "code" is used in place of the more descriptive terms "core" and "cord", especially since the thermal fuse as described in the application has a core, and is generally formed as a cord. Applicant is advised to review that the word "code" is intentionally used.

On page 2, line 22, the word "the" in between "In the light..." should be deleted (i.e. "In light..."). In line 23, the word "a" should be inserted before "code" (i.e. "...**a** code...").

On page 3, line 6, the word "a" should be inserted before "code" (i.e. "...**a** code...").

On page 4, line 33, the word "a" should be inserted before "code" (i.e. "...**a** code...").

On page 7, lines 17-19, the following changes should be made: in line 17, add an "s" to the end of both occurrences of the word "shape"; in line 18, change "has" to "have"; in line 19, add an "s" to the end of the word "shape". In line 23, insert the word "a" before "polygon" and also before "hexagon" (i.e. "...**a** polygon...**a** hexagon...").

On page 8, line 3, the word "The" should be deleted, and the "e" in "each" capitalized (i.e. "**E**ach..."). In line 16, an "s" should be added to the end of "temperature" and the word "of" deleted. In line 26, the word "an" should be inserted before "exterior". In line 35, the portion "covering with having" is unclear, and should be changed to "is covering" or a similar wording.

Applicant is advised to review the use of the symbol "Φ" that typically follows "mm" in the Example sections (for example, in (Example 1) on page 9, and also on pages 11-13). It is not clear why this symbol is present in the text.

On page 13, line 16, the word "lost" should be changed to "loss".

On page 15, line 20, the reference numeral **3** that designates the conductor should be changed to **103**.

On page 18, line 1, the reference numeral **3** that designates the conductor should be changed to **103**.

On page 23, line 28, the word "a" should be inserted before "characteristic".

On page 27, line 3, the first occurrence of the word "of" should be changed to "or".

On page 32, line, 4, the word "a" should be inserted before "keep-warm".

Applicant is advised to thoroughly review the specification for additional similar errors (in addition to the informalities noted above), particularly issues relating to proper grammar, tense, etc.

Appropriate correction is required.

Claim Objections

2. Claims 1-6 and 10 are objected to because of the following informalities:

Regarding Claims 1-3, 5 and 10, it is unclear as to exactly which direction the "length direction" is referring to within the fuse structure. It is advised to clearly orient which direction the "length direction" is, in relation to the structure of the claimed fuse (for example, the length direction *of said conductor*, see usage in Claim 4).

Further regarding Claims 1-3 and 10, regarding "inner/outer periphery", applicant is advised that the "periphery" can be interpreted as having no structural relation to the associated claimed element(s) (for example, the **insulating cover** in Claim 3). It is advised to structurally relate the "periphery" to the appropriate structural element, for example as done in Claim 4 ("...inner peripheral *side* of said insulating cover...").

Further regarding Claims 1-2, it is unclear if the **outer periphery** of the **fuse core** (Claim 1) is the same as the **outer periphery** of the **insulating core member** (Claim 2), since the **insulating core member** is a part of the **fuse core**. Applicant is advised to more thoroughly claim the **outer periphery** of the respective claim elements with respect to the associated element structures.

Further regarding Claim 4, line 3, the word "another" is used before the **line-shaped or braid-shaped insulator**, as if there were previous mention of a **line-shaped or braid-shaped insulator**. Claim 1, of which Claim 4 is dependent upon, only makes mention of an **insulating core member** and **insulating cover**; there is no mention of an existing **line/braid shaped insulator**. It is suggested to change the word "another"

to "a". Additionally in line 3, it is suggested to change the word "the" to "an", to avoid antecedent basis issues.

Regarding Claim 6, it is unclear as to exactly which direction the "peripheral direction" is referring to within the fuse structure. It is advised to clearly orient which direction the "peripheral direction" is, in relation to the structure of the claimed fuse (for example, the peripheral direction *of said conductor*).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a structure(s) that is capable of cutting the **conductor**. It is unclear how the **conductor** is "cut" merely by the expansion of the **insulating core member** or the contraction of the **insulating cover**.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Oh (US 4,736,180).

Regarding Claim 1, Oh teaches a fuse wire assembly for an electrical fuse, comprising:

- a **fuse core** (core assembly, 365, Fig. 8) comprising a **conductor** (inner fuse wire, 364, Fig. 8) wound on a flexible **insulating core member** (support core, 362, Fig. 8), wherein the **conductor** (inner fuse wire, 364) is capable of melting at a predetermined temperature (see col. 6, lines 47-52)
- an **insulating cover** (outer wrapper, 388, Fig. 8) that can be shrunk (i.e. contracted) due to heat and covers the outer periphery of the **fuse core** (core assembly, 365) (see col. 6, lines 50-56)

wherein the **conductor** (inner fuse wire, 364) is capable of being cut by expanding the **insulating core member** (support core, 362 – equivalent structure to core 62 from Fig. 5) at a predetermined temperature (wherein cut is being interpreted as being unable to flow current, for reasons related to the above 35 U.S.C. 112 rejection of Claim 1) (see col. 5, lines 24-34)

Regarding Claim 4, Oh teaches:

- a **line/braid-shaped insulator** (sleeve, 386, Fig. 8) made of woven flexible insulating material, provided on an inner peripheral side of the **insulating cover** (outer wrapper, 388, Fig. 8) (see col. 6, lines 50-56)
- a **conductor** (inner fuse wire, 364, Fig. 8) sandwiched between the **insulating core member** (support core, 362, Fig. 8) and the **line/braid-shaped insulator** (sleeve, 386) (see Fig. 8)

Regarding Claim 6, Oh teaches:

- a **line/braid-shaped insulator** (sleeve, 386, Fig. 8) made of woven flexible insulating material (see col. 6, lines 50-56)

wherein the **line/braid-shaped insulator** (sleeve, 386) is made of the same flexible insulating material as the **insulating core member** (support core, 362) which is an equivalent structure to core (62) that expands according to a predetermined temperature, and is therefore capable of expansion (see col. 5, lines 24-34).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (US 4,736,180)

Regarding Claim 5, Oh discloses that the **insulating cover** (outer wrapper, 388, Fig. 8) is made of a thermal-plastic shrink material that contracts (shrinks) in reaction to a predetermined temperature (see col. 6, lines 50-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the formed **line/braid-shaped insulator** (sleeve, 386) out of this material instead of the expanding material, in order to utilize the property of material contraction as opposed to material expansion.

10. Claims 2-3, 7-8 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (US 4,736,180) as applied to claims 1 and 4-6 above, and further in view of Kaltenborn et al. (US 2001/0019300 A1).

Regarding Claim 2, Oh discloses the claimed invention except for one or more **protrusions** formed on the outer periphery of the **insulating core member**.

Kaltenborn et al. teaches that it is known to have a fuse with **protrusions** (ribs, 4, Fig. 6b) located in the longitudinal direction and located on an outer periphery of the **insulating core member** (supporting body, 2, Fig. 6b) (see paragraphs [0030] and [0049]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included **protrusions** (ribs, 4) on the outer periphery of the **insulating core member** (supporting body, 2) as taught by Kaltenborn et al., since Kaltenborn et al. states at paragraph that such a modification would have aided in the winding of fuse elements inside the fuse (see paragraph [0049]). Please note that the "periphery" as claimed is not directly connected with a structure, and hence is being interpreted as any outer area of the **insulating core member**.

Regarding Claims 3 and 10, Oh discloses the claimed invention except for one or more **protrusions** formed on the inner periphery of the **insulating cover**. Kaltenborn et al. teaches that it is known to have a fuse with **protrusions** (ribs, 4, Fig. 6b) located in the longitudinal direction and located on an inner periphery of the **insulating cover** (housing, 1, Fig. 1a) (see paragraphs [0030] and [0049]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included **protrusions** (ribs, 4) on the inner periphery of the **insulating cover** (housing, 1) as taught by Kaltenborn et al., since Kaltenborn et al. states at paragraph that such a modification would have aided in the winding of fuse elements inside the fuse (see paragraph [0049]). Please note that the "periphery" as claimed is not directly connected

with a structure, and hence is being interpreted as any inner area of the **insulating cover**.

Regarding Claims 7 and 11-15, Oh discloses the claimed invention except for the **insulating core member** comprising a **gas-containing material** as a structural element. Kaltenborn et al. teaches that it is known to have a fuse with a structural **gas-containing material** (combustible element, 8, Fig. 6b) that releases gas upon combustion (see paragraphs [0032-0033]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included a gas-containing material as taught by Kaltenborn et al., since Kaltenborn et al. states at paragraph that such a modification would have allowed for appropriate thermal reactions to occur in the fuse once a predetermined temperature was reached (see paragraphs [0032-0034]).

Regarding Claim 8, Oh discloses the claimed invention except for the **insulating core member** comprising a **gas-containing material** covering a periphery of a **tensile resistant member** at the center of the **insulating core member**. Kaltenborn et al. teaches that it is known to have a fuse with a **gas-containing material** (combustible element, 8, Fig. 6b) covering a periphery of a **tensile resistant member** (base body, 3, Fig. 6b) at the center of the **insulating core member** (supporting body, 2, Fig. 6b) (see paragraphs [0030], [0032-0033]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included a gas-containing

material covering a periphery of a tensile resistant member of the insulating core member as taught by Kaltenborn et al., since Kaltenborn et al. states at paragraph that such a modification would have allowed for appropriate thermal reactions to occur in the fuse once a predetermined temperature was reached (see paragraphs [0032-0034]).

11. Claims 9 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (US 4,736,180) as applied to claims 1 and 4-6 above, and further in view of Cieplik et al. (US 6,269,745 B1).

Regarding Claims 9 and 18-20, Oh discloses the claimed invention except for the **thermal fuse** provided on a **flat surface** in a **serpentine manner**, with means for fixing a layout of the **thermal fuse**. Cieplik et al. teaches that it is known to have a fuse (1, Fig. 1a) on a **flat surface** (sheet form, see Fig. 1A) laid out in a **serpentine manner** (S-shape, see Fig. 1A) and having a means for fixing a layout of the fuse (a series connection) (see col. 2, lines 4-11 and col. 4, lines 18-26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to formed the fuse in a serpentine manner on a sheet with a layout fixing means as taught by Cieplik et al., since Cieplik et al. states at column 2, lines 4-11 that such a modification would have allowed for cost-effective mass production of the fuse.

12. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh (US 4,736,180) in view of Kaltenborn et al. (US 2001/0019300 A1), as applied to claims 2-3 above, and further in view of Cieplik et al. (US 6,269,745 B1).

Regarding Claims 16-17, Oh in view of Kaltenborn discloses the claimed invention except for the **thermal fuse** provided on a **flat surface** in a **serpentine manner**, with means for fixing a layout of the **thermal fuse**. Cieplik et al. teaches that it is known to have a fuse (1, Fig. 1a) on a **flat surface** (sheet form, see Fig. 1A) laid out in a **serpentine manner** (S-shape, see Fig. 1A) and having a means for fixing a layout of the fuse (a series connection) (see col. 2, lines 4-11 and col. 4, lines 18-26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to formed the fuse in a serpentine manner on a sheet with a layout fixing means as taught by Cieplik et al., since Cieplik et al. states at column 2, lines 4-11 that such a modification would have allowed for cost-effective mass production of the fuse.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- White (US 2,929,900 A)
- Fister (US 3,253,104 A)
- Kasamatu (US 3,869,689 A)
- Blewitt (US 3,925,745 A)

- Taki (US 4,177,444 A)
- Howard (US 4,253,080 A)
- Edwards (US 4,680,567 A)
- Reeder (US 5,736,919 A)
- Edwards (US 6,191,678 B1)
- Ranjan et al. (US 2002/0101323 A1)
- Muench et al. (US 6,538,550 B1)
- Jollenbeck et al. (US 6,650,223 B1)
- Wada et al. (JP 05128950 A)
- Hase (JP 06181028 A)
- Hase (JP 07176251 A)
- Nozue (JP 09129102 A)
- Nozue et al. (JP 10223105 A)

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley H. Thomas whose telephone number is 571-272-9089. The examiner can normally be reached on 7:30am - 5:00pm (Eastern) - First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash N. Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bradley H. Thomas
Examiner
Art Unit 2835

BHT

ANATOLY VORTMAN
PRIMARY EXAMINER